OBE Hydraulic Disc Brake

Installation and Service Manual

Haraka

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Original Bike Engineering Ltd
www.discobrakes.com

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Introduction

Congratulations, you have purchased a fully hydraulic disc brake system by Original Bike Engineering.

This manual contains important information about the safe installation, operation and maintenance of your disc brake. We urge you to read it carefully, become familiar with its contents and follow its recommendations to help make your new braking experience enjoyable and trouble free.

Although relatively little maintenance is required, you should not attempt to carry out any maintenance procedure until you are thoroughly familiar with the entire set of procedures. Do not overestimate your technical skill; if in any doubt leave installation and maintenance to a qualified technician.

Definitions

Warning: These matters must be abided by as there is the possibility of personal injury to yourself or to others.

Recommendation: It is advisable that these matters are abided by for the safe installation and maintenance of this brake system.

Important Safety Information

Warning: *As a serious rider you are aware of the need to practice safety in all aspects of the sport. This includes service and maintenance practices as well as riding practices. Before each ride, always check that your brakes are functioning correctly and check and replace the brake pads if worn. When you ride, always wear a helmet.*

Warning: *Installation of the disc brake system or any of its components should be carried out by a qualified technician with the correct tools. Improper installation could cause severe or fatal injuries.*

Warning: *This brake has been designed for use on a single person mountain bike only. Using it on any other vehicle or for any other purpose will void the warranty and could cause serious injury.*

Warning: *Disc brake parts can become extremely hot with use. Always allow parts to cool before attempting to service your bike. Never touch either the brake rotor or the brake caliper after braking as this may cause serious burns. Wait for parts to cool down before doing any work on them.*

Warning: *When following any of the installation or servicing procedures, make sure you keep your hands and fingers away from getting caught in the brake rotor. Failure to do this can result in injury.*

Warning: *For downhill riding, use a 203mm (8 Inch) brake rotor. Before installing a 203mm brake rotor on your frame or fork, ensure that your frame or fork is capable of accepting it. Check with your frame or fork manufacturer.*

Warning: *Using a 160mm (6 Inch) brake rotor for downhill riding may cause the brake fluid to overheat or even boil and may cause brake failure resulting in serious injury.*

Warning: *If you suspect damage to your brakes always get them checked by a qualified technician*

Warning: *Before using your brakes for the first time, ensure that the lever you expect to operate the front brake (right or left) does in fact operate the front brake. If this is not the case, the hoses should be swapped to avoid unintentional braking, and potential risk of accidents and injury. Follow the procedure in this manual to swap the hoses or ask a qualified technician if you are unsure.*

Warning: *If you notice changing braking points during a ride, you may have air in your brake system, and you should stop riding. Before using the brake system again, the brakes must be bled using the procedures outlined in this manual.*

Warning: *Always protect your brake rotors and brake pads from oils, lubricants, detergents and soaps. Such substances contaminate the pads and cause a permanent loss of braking power. Contaminated pads must be replaced before riding.*

Warning: *If your bike is involved in a crash, you must check your brakes before riding to ensure they are functioning properly.*

- Check that all components are securely mounted to the handlebar, frame and fork.
- Check that the pads are properly seated & retained within the caliper.
- Check the hose and fittings for any kinks or damage to the reinforcing braiding.
- Check the master cylinder body and caliper for damage.
- Check the hose and fittings for any leaks by activating the lever, holding it, and checking the hose connections and reservoir cover for leaking brake fluid.
- Check that the brake operates & bites onto the brake rotor. The lever should not pull back to the handlebar. If it does see the maintenance section to rectify it.

Warning*: Do not ride your bike unless your wheels move freely without drag. If your brake rotor is dragging on your pads it will cause premature brake pad wear and inconsistent braking, which may cause injury. Check that your wheels are mounted correctly, and all fastenings are correctly tightened. Follow the procedures in this manual to ensure your brakes are setup correctly.*

Recommendation: *If using quick release skewers, we recommend the use of steel skewers only.*

Recommendation: *We recommend a 3 cross spoke pattern. If the wheel has to be rebuilt it should be done by a qualified technician.*

Installation

The following procedures cover the installation of OBE Disc Brakes. A qualified technician with the correct tools should carry out installation of any disc brake components. Improper installation could cause severe or fatal injuries.

The disc brake system is supplied fully assembled, containing brake fluid and is factory bled.

Recommendation: *To start with, you should install the brake as supplied without disconnecting the hose. After using the brake for a while you may want to consider shortening the hose or routing it through your frame.*

Tools Required for Installation

- Torx T25 driver
- Open-end wrenches; 6mm, 8mm, 10mm
- Hose cable cutters
- Small flat head and Philips screwdrivers
- Allen screwdrivers (Hex keys): 4mm and 5mm
- Torque wrench

Fitting the Disc Rotors

Mounting the brake disc rotor to the wheel requires care. The disc rotor is compatible with International Standard 6 bolt hubs.

Recommendation: *We advise the use of thread lock on disc rotor bolts to enhance the locking and prevent them from unscrewing. Do not use a permanent adhesive.*

1. Clean the disc and the hub-mounting surface with isopropyl alcohol.

Warning: *Do not use disc brake cleaner.*

2. Place the disc on the hub's mounting surface. Be sure that the arrow on the disc is pointing in the same direction of the forward wheel rotation.

Warning: *Be sure to install the disc rotor with the right side facing upward. Failure to do so may result in failure of the disc and severe injury. If the disc is the right way around, you will be able to see the arrow on the disc rotor while tightening the bolts. The arrow and text on the disc rotor faces outwards from the hub.*

3. Use a Torx T25 screwdriver to tighten the disc screws to 5.6 NM (50 in-lbs). For even tightening, tighten each screw a little at a time and skip alternate screws in the tightening sequence until all 6 screws are equally tightened.

4. After 12 hours of use, check and re-tighten the disc rotor screws.

Warning: *To avoid burns, do not touch the disc immediately after use.*

Fitting the lever and master cylinder

1. Mount the brake lever to the handlebar with a Torx T25 screwdriver. There is no need to remove the grips or other controls. Tighten to 3.4 Nm (30 in-lbs).

2. Route the brake hose along the frame/fork to the calipers taking care to avoid parts of the bike where the hose could be potentially trapped (such as near rear suspension linkages) or could rub against moving parts (such as the wheels), and avoiding sharp bends in the hose.

Fitting the Calipers

Warning: *When following any of the procedures below, be sure to keep your hands and fingers from getting caught in the brake rotor. Failure to do so could result in injury.*

1. Remove the wheel, any calipers and adaptors already fitted to the frame or the fork and check for the following:

- Make sure that the caliper fitting eyelets on your frame or fork are free of any paint, powder coating or burrs. The eyelets on a new frame or fork need to be checked carefully. A newly painted frame or fork will need to have its caliper fitting eyelets faced. If unsure, have them faced by a qualified technician using the proper facing tool.

Recommendation: *Before fitting a disc brake, have a qualified technician machine the frame & fork mounts with a facing tool to ensure they are square to the axis of the hub.*

- Ensure that the brake pads are fully retracted in the caliper. New brakes are supplied fully retracted with the plastic transport spacer inserted between the pads. If you need to do this yourself follow the procedure for Pad Removal in this manual, and then follow the procedure for Pad Insertion.

Recommendation*: Do not remove the transport insert until you are ready to install the wheel.*

2. If you have an adaptor to install between the caliper and frame, or caliper and fork, mount it to the frame or fork using the two (2) M6 adaptor bolts and two (2) washers supplied with the OBE brake. Leave the bolts loose enough so that the adaptor can be moved in its slots for alignment.

3. Mount the caliper to the frame or adaptor using the two (2) M6 caliper bolts. Leave them loose enough so that caliper can be moved for alignment with the brake rotor.

4. Remove the plastic transport insert from each caliper & re-fit the wheels securely.

Recommendation: *Keep the plastic transport insert in a safe place for future use. Re-insert it between the brake pads whenever you remove the wheels.*

5. If you have fitted an adaptor, move it until it is just free of the circumference of the disc rotor. Tighten the adaptor bolts to a torque of 12.4 Nm (110 in-lbs).

6. Centralise the caliper equally on either side of the disc rotor using the shim washers provided, by fitting them between the caliper / adaptor and the frame or the fork mounts. This involves some trial and error until the correct positioning is achieved.

Spin the wheel and check that it spins freely and that the gaps, between the pads and the disc are equal. If necessary loosen the mounting bolts and repeat steps 5 and 6 until the wheel spins freely and the space between pads and disc are equal on either side of the disc.

When finished, torque the mounting bolts to 12.4 Nm (110 in-lbs).

Warning: *For post mount forks, torque the mounting bolts to 9 Nm (80 in-lbs).*

Securing the Hose & Completing the Installation

1. After the caliper and lever have been mounted onto the bike, secure the hose to the frame using zip ties or hose guides. Check that:

- The handlebar is unrestricted
- The hose cannot be trapped in moving parts
- The hose does not rub on moving parts
- The hose does not kink at any time

2. With the bike upright on its wheels, squeeze the lever several times (pump) until the lever feel becomes firm. This will push the pads to their correct position on either side of the rotor.

3. New pads and rotors will need to be bedded-in by following the instructions in this manual.

Bedding In Period

To achieve maximum braking power and brake pad longevity, new brake pads and new rotors need to be bedded-in. Take your bike to a safe place & stop hard 30 to 40 times from about 20 mph (30 kph). During the bedding-in period some noise may occur.

Personal Settings

To Position the Master Cylinder and Lever:

1. Loosen the handlebar clamp screws using a Torx T25 screwdriver

2. Position the Master Cylinder and Lever on the handlebar in your preferred location and at your preferred angle

3. Tighten the handlebar clamp screws to a torque of 3.4 Nm (30 in-lbs)

Lever Reach Adjustment

In most cases, the factory settings for lever reach adjustment will be suitable for your bike.

If necessary, use a flat blade screwdriver to adjust the lever reach by turning the push rod that goes through the lever.

Warning: *Do not attempt to force the adjustment screw beyond its limits.*

Transport of the bicycle

When transporting a disc brake equipped bicycle, you should keep the following points in mind:

- Insert the transport spacer (supplied with the brake) between the brake pads whenever the wheel is removed from the bike.
- Never depress the brake lever without the brake pads in place and the wheels mounted.
- Make sure that the rotors are not damaged, deformed or contaminated with lubricants.
- Do not transport the bike upside-down.
- For transport in an aircraft, there is no need to empty the fluid from the hydraulic system, you can leave the brake as it is.

Service & Maintenance

Brake Pads

Replace the brake pads when the friction material has worn down to 0.6mm.

Warning: *Do not wait until the friction material has worn down to the metal as the brake rotor will get damaged and the brake may not function causing serious or fatal injury.*

Pad Removal

1. Remove the wheel.

2. Slowly push the brake pads apart by inserting pieces of thin card between them, until they are far enough apart to remove one brake pad and then the other.

Warning: *Do not use a screwdriver or sharp object to prize the pads apart as this will ruin the brake pads and they will need to be replaced.*

3. Push one of the pads, using its tab on its metal back plate, towards the middle of the caliper, then pull to disengage the small spring holding it on to a post in the center of the piston. Remove the pad once it is disengaged from the post.

4. Repeat for the other pad.

5. When the pads have been removed follow the Pad Insertion procedure.

Pad Insertion

1. Push the caliper pistons back as far as they will go using the boxed end of a 10mm wrench.

Warning: *Do not push on the post in the centre of the piston because it will bend and will need to be replaced.*

2. Put the outer pad in first. Note that the pads are different. Use the tab in the centre of the metal backing plate to push the new pad into place by angling it and pushing gently until its spring snaps into place.

3. Check the pad is properly locked into place & repeat for the inner pad.

4. Re-install the wheel.

5. With the bike upright, squeeze the lever several times (pump) until the lever feel becomes firm. This will push the pads to their correct position.

6. New pads will need to be bedded-in by following the instructions in this manual.

Cleaning

Warning: *The brake disc rotor and pads should not be cleaned with disc brake cleaner. Use only isopropyl alcohol.*

Pistons Pushed Out

If the brake lever is pulled without the disc rotor or the transport spacer between the pads, the caliper pistons will be pushed out & the brake pads will be too close together. This will prevent the re-installation of the wheel (disc rotor), or will prevent the wheel from spinning freely.

Bleeding the System

Bleeding means pumping new brake fluid into the system to replace the existing fluid and push out any trapped air and water.

Air trapped in the hydraulic system of the disc brake will decrease the performance and feel of the brake, making it feel spongy. The air can be removed by bleeding.

If the hose length is shortened, or the hose is detached to route it through the frame, or the right & left lever's hoses are swapped due to local convention or personal preference, and there is loss of brake fluid during the procedure, the brake will need to be bled.

Warning: *If you get brake fluid on the brake pads they are ruined and dangerous to use. Replace them with new pads. If you get brake fluid on the disc, clean it thoroughly using isopropyl alcohol. Do not use disc brake cleaner.*

Warning: *OBE Hydraulic brakes use DOT4 or DOT5.1 brake fluid only. If you use any other fluid it will cause serious damage to the brake system resulting in brake failure.*

Warning: *Only use new, good quality brake fluid. Using poor quality or old brake fluid will decrease performance and may result in vapour lock.*

Warning: *Carefully read the instructions that come with the brake fluid.*

Warning: *Only use new brake fluid that has come from a closed bottle. Always replace the brake fluid bottle's cap to prevent contamination. Some DOT fluids absorb moisture and will deteriorate and spoil.*

Warning: *Brake fluid will strip paint so wipe any spillage up immediately and clean the area thoroughly with isopropyl alcohol.*

Warning: *Discard old brake fluid in a responsible manner and in accordance with local laws. Do not pollute drains or the environment.*

Warning: *DOT brake fluid can be an irritant. Avoid contact with skin & eyes and do not ingest. Wear safety glasses when handling brake fluid and bleeding or maintaining your brakes. Follow the instructions provided with the brake fluid in case of contact with eyes, skin or if ingested.*

Procedure for Bleeding

1. Remove the wheels to prevent contamination of the disc rotors.

2. Remove the brake pads to prevent contamination. Follow the Pad Removal instructions in this manual.

3. Push the caliper pistons back as far as they will go using the boxed end of a 10mm wrench.

Warning: *Do not push on the post in the centre of the piston because it will bend and will need to be replaced.*

4. Insert a spacer between the pistons to prevent them pushing back out during the bleeding procedure.

5. Loosen the lever handlebar clamp screws using a Torx T25 screwdriver and reposition the brake lever so that the master cylinder is level and horizontal. Slightly tighten the screws in this position.

6. Remove the master cylinder cap by removing the 4 allen screws, using a 2mm allen key. Then remove the rubber diaphragm inside.

7. Place the closed end of a 6mm spanner over the bleed nipple on the brake caliper. Fit a length of approximately 30cm of clear plastic hose onto the bleed nipple and put the other end into an empty container to catch the fluid. Ensure that the hose is a tight fit.

8. Fill the master cylinder reservoir with brake fluid.

9. Open the bleed nipple on the caliper one quarter of a turn.

10. Slowly pull the brake lever to the handlebar and hold.

11. Close the bleed nipple & release the lever. The bleed nipple must be closed before the lever is released to avoid sucking air into the system.

12. Repeat steps 8, 9 and 10 until no further air is seen coming out of the bleed nipple. Refill the master cylinder reservoir as required during this procedure.

13. Make sure the pistons are fully pushed back into the caliper. If not, follow step 3 again to push the pistons back.

14. Hang a towel around the master cylinder to soak up any spills, and then fill the master cylinder reservoir for the last time.

15. Replace the rubber diaphragm. The fluid will overflow. Close the bleed nipple and remove the hose. Wipe away excess fluid from the caliper and lever.

Warning: *Do not over-tighten the bleed nipple on the caliper*

16. Replace the master cylinder reservoir cap and gently tighten the 4 allen screws with a 2mm allen key.

Warning: *Do not over-tighten the master cylinder reservoir cap allen screws.*

17. Replace the pads by following the procedure for Pad Insertion.

18. Check for system leaks.

Changing the brake fluid

For normal use, change the brake fluid every 3 to 4 years. For extreme use, change the brake fluid every year.

To change the brake fluid, follow the bleeding procedure.

Fill the master cylinder reservoir five times, and pump the fluid through the system each time.

Hose Changes

Your OBE hydraulic disc brake is supplied fully assembled and factory bled. The hose length will suit the majority of forks and frames. However you may wish to make hose changes, for example in the following circumstances:

- To shorten the hose
- To detach the hose and route it through the frame
- To replace a damaged hose
- To swap right and left brake levers to suit your personal preference or the normal setup used in your locale

If the following procedure is carried out carefully and correctly there should be no fluid loss, and there is no need to re-bleed the hydraulic system.

1. Remove the wheels to prevent contamination of the rotors

2. Remove the brake pads to prevent contamination. Follow the Pad Removal instructions in this manual.

3. Push the caliper pistons back as far as they will go using the boxed end of a 10mm wrench. Insert a spacer to keep the pistons apart.

Warning: *Do not push on the post in the centre of the piston because it will bend and will need to be replaced.*

4. At the lever, slide off the plastic hose connector shroud and slide it away from the connector.

5. Unscrew the hose connector fitting using an 8mm open ended wrench and slide it down the hose.

6. Detach the hose by gently pulling.

Warning: *Once separated hold the hose carefully as it contains brake fluid that could leak out easily.*

7. Make the hose change(s). For example:

- Trim the hose to the desired length using a hose cutter tool to give a clean square cut.

  Warning*: Do not shorten the hose to such an extent as to hamper or restrict handlebar movement.*

- Route the hose through fork or frame guides taking care:

  - To avoid tight bends, which could cause kinks.

  - To avoid routing the hose such that it could get trapped in moving parts.

  - That the hose does not rub on moving parts such as the wheels.

8. Pull the lever very gently and when a small drop of brake fluid is visible at the end of the connector, push the hose onto the connector.

9. Slide the connector fitting back into place & tighten.

10. Slide the plastic hose connector shroud back into place.

If replacing the hose due to damage or a leak, the hose can be disconnected from the caliper in the same way as it is disconnected from the lever.

Troubleshooting

The following table provides a quick reference to causes & solutions of most common problems.

Refer to the relevant section in this manual for the correct procedures to follow for each solution. A qualified technician should carry out all work.

Symptom	Possible Problem	Solution
Lever pulls right back to the handlebar	Pads not re-set after a service	Pump the lever
	Air in system	Bleed system
… only occurs after long periods of braking	Water in system	Bleed system
No braking power	New pads or rotor not bedded in correctly	Bed in new pads/rotor
	Disc is dirty	Clean disc
	Pad contaminated	Replace pads
Disc rubbing on pads	Wheel not seated correctly	Re-install wheel
	Caliper not centered over rotor	Realign caliper
	Not enough clearance between pads & rotor	Push pistons back into caliper
	Warped disc	Replace disc
Spongy lever feel	Air in system	Bleed system
	Frame or fork mounts out of alignment	Face frame/fork mounts
	Incorrect fluid used	Replace seals and Bleed system
Pads fall out	Damaged piston	Replace piston
	Damaged Pads or Spring	Replace Pads
Fluid Leak	Crash damage	For spare parts consult www.discobrakes.com
	Very old seals	

Warranty

Original Bike Engineering (OBE) Disc Brakes are warranted for a period of 12 months from original purchase date, against defects in materials and workmanship.
The warranty only applies to the original owner and a proof of purchase is required. The product must be returned to OBE before any warranty claim can be processed. Any product that OBE finds to be defective will be repaired or replaced at the discretion of OBE. This warranty does not cover bending, damage or breakage that has resulted or may have resulted from crashes or falls. This warranty does not cover any damage or defects caused by alterations or modifications of OBE Disc Brakes or parts thereof, or by normal wear, improper maintenance, damage(s) caused by the use of other manufacturers' parts, improper use or abuse of the product, or failure to follow instructions contained in an instruction manual for OBE Disc Brakes. Any modifications made by the user will render the warranty null and void. The cost of normal maintenance, or replacement of service items that are not defective, shall be paid for by the original purchaser. OBE shall not be held liable for any indirect, special or consequential damages. This warranty does not affect your statutory rights.